

REMARKS

This paper is filed in response to the official action mailed on May 26, 2005, wherein claims 1-11 were rejected. In response, claim 1 has been amended; claims 1-11 remain pending.

Turning to the rejections based upon the prior art, the Patent Office rejects claims 1-3 and 7-9 under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,937,309 ("Chuang"). In response, claim 1 has been amended to clarify the claimed invention and also to clearly distinguish the Chuang reference.

At the outset, under MPEP § 2131,

"[t]o anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."

Citing, Verdegaa Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The Chuang reference discloses an STI with rounded corners, but the Chuang reference achieves these rounded corners in a completely different method than that of amended claim 1. Specifically, while the Chuang reference discloses the deposition of a pad oxide 205 and a stop or nitride layer 210, the Chuang reference does not etch these layers and does not form an inwardly extending tapered protrusion from layers 205 or 210 in order to achieve the rounded corner features. Instead, Chuang deposits a second sacrificial layer 225 that is used to achieve the rounded or smooth profiles shown at 230a and 230b. See column 3, lines 15-25 of Chuang. The second sacrificial layer 225 is made from polysilicon or silicon oxide and "preferably includes the same material as the substrate 200" as set forth at column 3, lines 44-45. See also column 3, line 17. Thus, the rounded profile shown at 230a and 230b of Chuang is achieved by way of the second sacrificial layer 225, not a nitride layer and an oxide layer as recited in claim 1. The silicon nitride layer 210 and the pad oxide layer 205 of Chuang are etched with a vertical profile as shown in Figures 2A-2C of Chuang.

Therefore, Chuang does not etch the nitride and oxide layers 210, 205 so that tapered inwardly extending protrusions are generated from these nitride and oxide layers as recited in amended claim 1. Instead, Chuang uses a second sacrificial layer 225 to achieve the rounded profile. The spacers 245a shown in Fig. 2C of Chuang are not generated from the nitride or oxide layers 210, 205. The spacers 245a are made from the sacrificial layer 225 and preferably include the same material as the substrate 200 as they are simultaneously etched with the substrate 200 as shown in Fig. 2C of Chuang and described at column 3, lines 43-59.

Therefore, Chuang does not teach or suggest the etching of a nitride layer disposed on top of an oxide layer in such a manner so as to form a tapered inwardly extending protrusion as recited in amended claim 1. The Chuang process is clearly more complicated and more costly than that of amended claim 1. Because Chuang does not teach or suggest all of the elements of amended claim 1, Applicants respectfully submit that the anticipation rejection of claims 1-3 and 9 is improper and must be withdrawn.

Next, the Patent Office rejects claims 4-6 under 35 U.S.C. §103 as being obvious in view of Chuang in view of U.S. Patent No. 6,890,859 ("Bamnlker"). Applicants respectfully submit that his rejection is improper as no *prima facie* case of obviousness has been established.

Under MPEP § 2142,

"[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure."

Citing, In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); *see also* MPEP § 2143-§ 2143.03 for decisions pertinent to each of these criteria.


As noted above, Chuang does not teach or suggest the forming of the tapered inwardly extending protrusions from a nitride and oxide stacked layer structure as recited in amended claim 1. Bamnolker is only cited for the proposition that it teaches the use of certain etch gases. However, Bamnolker does not teach or suggest etching a pad nitride and pad oxide layer structure so as to create tapered inwardly extending protrusions from the pad nitride and pad oxide layers. Therefore, no combination of Chuang and Bamnolker teaches or suggests every element of amended claim 1 and therefore the obviousness rejections of claims 4-6 are improper and must be withdrawn.

Finally, the Patent Office rejects claims 10 and 11 under 35 U.S.C. §103 as being unpatentable over Chuang in view of U.S. Patent No. 6,500,727 ("Chen"). Applicants respectfully submit that this rejection is improper because no *prima facie* case of obviousness has been established. The deficiencies of Chuang are discussed above. Chen is merely cited for the proposition that it teaches a silicon etching method. However, Chen does not teach or suggest forming tapered inwardly extending protrusions by etching a pad nitride layer and pad oxide layer. Thus, no hypothetical combination of Chen and Chuang teaches or suggests every element of amended claim 1 and therefore the obviousness rejections of claims 10 and 11 is improper and should be withdrawn.

Accordingly, the applicants respectfully submit that this application is in a condition for allowance and an early action so indicating is respectfully requested.

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Respectfully submitted,

By 
James P. Zeller (Reg. No. 28,491)
MARSHALL, GERSTEIN & BORUN LLP
233 South Wacker Drive
6300 Sears Tower
Chicago, Illinois 60606-6357
(312) 474-6300
Attorneys for Applicant